AMENDMENTS TO THE CLAIMS

Listing of the claims:

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

1. (Currently Amended) A MOS-type solid-state image pickup device, comprising:

a semiconductor substrate;

a large number of pixels arranged in one surface of said semiconductor substrate in an array having a plurality of rows and a plurality of columns, each said pixel ~~includes~~ including (a) a photoelectric converter element having a cathode and (b) a switching circuit electrically connected to said cathode of the photoelectric converter element for controlling generation of an output signal representing electric charge accumulated in said cathode ~~photoelectric converter element~~ and discharge of the electric charge from said cathode;

a plurality of row selection signal ~~line~~ lines disposed along a row direction, ~~for~~ each being associated with one pixel row ~~and being electrically connected to associated switching circuits, each said row selection signal line receiving~~ for supplying a row selection signal ~~for controlling the generation of the output signal~~;

a plurality of output signal lines disposed along a column direction, each ~~of which~~ being associated with at least one pixel column ~~and receiving the output signal from associated switching circuits~~;

a plurality of reset signal ~~line~~ lines disposed along the row direction, ~~for~~ each being associated with one ~~said~~ pixel row ~~and being electrically connected to associated switching circuits, each said reset signal line receiving~~ for supplying a reset signal ~~for controlling the discharge of the electric charge~~; ~~and~~

a power source line; and

an overall reset controller ~~positioned within a column-directional shifter~~ for supplying ~~the~~ an overall reset signal to all of said reset signal lines at one time;

wherein said switching circuit comprises:

a series connection of an output transistor and a selection transistor connected between the power source line and an associated output signal line, the output transistor having a gate being capable of receiving a potential generated by the charge accumulated in said cathode, the selection transistor having a gate connected to an associated row selection signal line; and

a reset transistor connected between said cathode and said power source line, and having a gate connected to an associated reset signal line

~~an overall reset controller positioned within a column-directional shifter for supplying the reset signal to said reset signal lines at one time~~.

Claims 2 and 3 (Canceled)

4. (Original) A MOS-type solid-state image pickup device according to claim 1, further comprising:

a readout row-shifter for sequentially supplying the row selection signal to said row selection signal lines;

a reset row-shifter for sequentially supplying the reset signal to said reset signal lines; and

an image signal outputting device electrically connected to said output signal lines for generating an image signal representing the output signal and for sequentially outputting the image signal.

5. (Currently Amended) A MOS-type solid-state image pickup device according to claim 4, wherein said image signal outputting device comprises:

at least one ~~an~~ analog signal generator for converting the output signal generated on each said output signal line into an analog voltage signal; and

a row-directional shifter for controlling operation of said analog signal generator and for ~~being~~ sequentially ~~outputted~~ outputting the analog voltage signal from said at least one analog signal generator.

6. (Previously Presented) A MOS-type solid-state image pickup device according to claim 4, wherein said image signal outputting device comprises:

an analog signal generator for converting the output signal generated on each said output signal line into an analog voltage signal;

an analog-to-digital converter for receiving the analog voltage signal and for converting the analog voltage signal into a digital signal; and

a buffer memory for receiving the digital signal, temporarily keeping the digital signal therein, and outputting the digital signal therefrom.

7. (Original) A MOS-type solid-state image pickup device according to claim 4, further comprising a controller for controlling operations of said overall reset controller, said readout row-shifter, said reset row-shifter, and said image signal outputting device.

8. (Currently Amended) A MOS-type solid-state image pickup device according to claim [[2]] 1, further comprising:

a transfer signal line disposed for each said pixel row ~~and being electrically connected to associated switching circuits~~; and

a transfer control row-shifter for sequentially supplying a transfer control signal ~~controlling the generation or the discharge of the output signal~~ to said transfer signal lines, and

each said switching circuit further comprises a ~~charge~~ transfer transistor electrically connected ~~to said photoelectric converter element,~~ between said cathode and the gate of said output transistor, which gate is also connected to ~~and~~ said reset transistor, said ~~charge~~ transfer transistor including a control terminal electrically connected to said transfer signal line.

9. (Canceled)

10. (Currently Amended) A MOS-type solid-state image pickup device according to claim 8, further comprising:

a readout row-shifter for sequentially supplying the row selection signal to said row selection signal lines;

a reset row-shifter for sequentially supplying the reset signal to said reset signal lines;

~~a transfer control row-shifter for sequentially supplying the transfer control signal to said transfer signal lines;~~ and

an image signal outputting device electrically connected to said output signal lines for generating an image signal representing the output signal and for sequentially outputting the image signal.

11. (Currently Amended) A MOS-type ~~AMOS-type~~ solid-state image pickup device according to claim 10, wherein said image signal outputting device comprises:

at least one ~~an~~ analog signal generator for converting the output signal generated on each said output signal line into an analog voltage signal; and

a row-directional shifter for controlling operation of said analog signal generator and for ~~being~~ sequentially ~~outputted~~ outputting the analog voltage signal from said analog signal generator.

12. (Previously Presented) A MOS-type solid-state image pickup device according to claim 10, wherein said image signal outputting device comprises:

an analog signal generator for converting the output signal generated on each said output signal line into an analog voltage signal;

an analog-to-digital converter for receiving the analog voltage signal and for converting the analog voltage signal into a digital signal; and

a buffer memory for receiving the digital signal, temporarily keeping the digital signal therein, and outputting the digital signal therefrom.

13. (Original) A MOS-type solid-state image pickup device according to claim 10, further comprising a controller for controlling operations of said overall reset controller, said readout row-shifter, said reset row-shifter, said transfer control row-shifter, and said image signal outputting device.

14. (Currently Amended) A digital camera, comprising:

a MOS-type solid-state image pickup device, comprising:

(i) a semiconductor substrate;

(ii) a large number of pixels arranged in one surface of said semiconductor substrate in an array having a plurality of rows and a plurality of columns, each said pixel ~~includes~~ including (a) a photoelectric converter element having a cathode and (b) a switching circuit electrically connected to said cathode of the photoelectric converter element for controlling generation of an output signal representing electric charge accumulated in said cathode ~~photoelectric converter element~~ and discharge of the electric charge from said cathode;

(iii) a plurality of row selection signal ~~line~~ lines disposed along a row direction, ~~for~~ each being associated with one pixel row ~~and being electrically connected to associated switching circuits, each said row selection signal line receiving~~ for supplying a row selection signal ~~for controlling the generation of the output signal~~;

(iv) a plurality of output signal lines disposed along a column direction, each ~~of which~~ being associated with at least one pixel column ~~and receiving the output signal from associated switching circuits~~;

(v) a plurality of reset signal ~~line~~ lines disposed along the row direction, ~~for~~ each being associated with one ~~said~~ pixel row ~~and being electrically connected to associated switching circuits, each said reset signal line receiving~~ for supplying a reset signal ~~for controlling the discharge of the electric charge~~;

(vi) a readout row-shifter for sequentially supplying the row selection signal to said row selection signal lines;

(vii) a reset row-shifter for sequentially supplying the reset signal to said reset signal lines;

(viii) an overall reset controller ~~positioned within a column-directional shifter~~ for supplying ~~the~~ an overall reset signal to all of said reset signal lines at one time; ~~and~~

(ix) an image signal outputting device electrically connected to said output signal lines for generating an image signal representing the output signal and for sequentially outputting the image signal; and

(x) a power source line;

wherein said switching circuit comprises:

a series connection of an output transistor and a selection transistor connected between the power source line and an associated output signal line, the output transistor having a gate being capable of receiving a potential generated by the charge accumulated in said cathode, the selection transistor having a gate connected to an associated row selection signal line; and

a reset transistor connected between said cathode and said power source line, and having a gate connected to an associated reset signal line;

an image signal processor for generating mobile picture data or still picture data using the image signal outputted from said MOS-type solid-state image pickup device;

a light shielding device for interrupting light incident to said MOS-type solid-state image pickup device;

a still picture indication signal generator for generating a still picture indication signal indicating shooting of a still picture;

a mobile picture mode controller electrically connected to said MOS-type solid-state image pickup device for continually control operation thereof for repeatedly conducting (a) an image readout operation in which the row selection signal is sequentially supplied from said readout row-shifter to a predetermined number of row selection signal lines for sequentially outputting from said image signal outputting device an image signal representing the output signal generated on each said output signal line and (b) an electronic shutter operation in which the reset signal is sequentially supplied from said reset row-shifter to said reset signal supply lines at least associated with said pixel row as an object of the image signal readout operation for sequentially discharge electric charge accumulated in said photoelectric converter elements; and

a first still picture mode controller electrically connected to said MOS-type solid-state image pickup device for controlling in place of said mobile mode controller, when the still picture indication signal is outputted, operations of said MOS-type solid-state image pickup device and said light shielding device, for conducting an overall reset operation in which the overall reset controller is operated, in a state in which the operations of said readout row-shifter and said rest row-shifter are stopped, and electric charge accumulated in all said photoelectric converter elements is discharged, and for conducting an image signal readout operation in which said light shielding device is operated and interrupts the incident light for a predetermined period of time after the overall reset operation is finished, and the row selection signal is sequentially supplied from said readout row-shifter to said row selection signal lines for sequentially outputting an image signal representing the output signal generated on said output signal lines from said image signal outputting device.

15. (Previously Presented) A digital camera according to claim 14, wherein:

when an electronic shutter operation or an image signal readout operation is being executed at a point of time when the still picture indication signal is outputted, said first still picture mode controller does not interrupt the operation; and

when an electronic shutter operation is being executed at a point of time when the still picture indication signal is outputted, said first still picture mode controller conducts the image signal readout operation once after the electronic shutter operation; and then the first still picture mode controller conducts the overall reset operation.

16. (Currently Amended) A digital camera according to claim 14, wherein said MOS-type solid-state image pickup device further comprises:

a transfer signal line disposed for each said pixel row ~~and being electrically connected to associated switching circuits~~; and

a transfer control row-shifter for sequentially supplying a transfer control signal ~~controlling the generation or the discharge of the output signal~~ to said transfer signal lines, and

each said switching circuit further comprises

a ~~charge~~ transfer transistor electrically connected ~~to said photoelectric converter element,~~ between said cathode and the gate of said output transistor, which gate is also connected to ~~and~~ said reset transistor,

said ~~charge~~ transfer transistor including a control terminal electrically connected to said transfer signal line

said mobile picture mode controller or said first still picture mode controller conducting said transfer control row-shifter for sequentially supplying, in the image readout operation, the row reset operation, or the overall reset operation, the transfer control signal to each said transfer signal lines associated with said pixel row as an object of the operation.

17. (Previously Presented) A digital camera according to claim 14, further comprising:

a strobe device for emitting flash light when a predetermined signal is received or said strobe device installing device for installing therein;

a second still picture mode controller electrically connected to said MOS-type solid-state image pickup device for controlling in place of said mobile mode controller, when the still picture indication signal is outputted, operations of said MOS-type solid-state image pickup device and said light shielding device, for conducting an overall reset operation in which the overall reset controller is operated, in a state in which the operations of said readout row-shifter and said rest row-shifter are stopped, and electric charge accumulated in all said photoelectric converter elements is discharged, and for conducting an image signal readout operation in which after the overall reset operation is finished, a strobe device operation signal is generated for operating said strobe device; said light shielding device is operated and interrupts the incident light for a predetermined period of time after said strobe device operation signal is generated; and the row selection signal is sequentially supplied from said readout row-shifter to said row selection signal lines for sequentially outputting an image signal representing the output signal generated on said output signal lines from said image signal outputting device; and

a still picture mode specifying device for specifying, beforehand, a still picture mode controller to be operated when the still picture indication signal is outputted.

18. (Previously Presented) A digital camera according to claim 17, wherein:

when an electronic shutter operation or an image signal readout operation is being executed at a point of time when the still picture indication signal is outputted, said second still picture mode controller does not interrupt the operation; and

when an electronic shutter operation is being executed at a point of time when the still picture indication signal is outputted, said second still picture mode controller conducts the image signal readout operation once after the electronic shutter operation; and then the second still picture mode controller conducts the overall reset operation.

19. (Currently Amended) A digital camera according to claim 17, wherein said MOS-type solid-state image pickup device further comprises:

a transfer signal line disposed for each said pixel row ~~and being electrically connected to associated switching circuits~~; and

a transfer control row-shifter for sequentially supplying a transfer control signal ~~controlling the generation or the discharge of the output signal~~ to said transfer signal lines, and

each said switching circuit further comprises

a ~~charge~~ transfer transistor electrically connected ~~to said photoelectric converter element,~~ between said cathode and the gate of said output transistor, which gate is also connected to ~~and~~ said reset transistor,

said ~~charge~~ transfer transistor including a control terminal electrically connected to said transfer signal line.

said mobile picture mode controller, said first still picture mode controller or said second still picture mode controller conducting said transfer control row-shifter for sequentially supplying, in the image readout operation, the row reset operation, or the overall reset operation, the transfer control signal to each said transfer signal lines associated with said pixel row as an object of the operation.